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Page 13 of 22

## Amendment and Response

Serial No.: 10/626,261

Confirmation No.: 9585

Filed: 24 July 2003

For: HARDENABLE THERMALLY RESPONSIVE COMPOSITIONSRemarks

The Office Action mailed 19 April 2006 has been received and reviewed.

The specification has been amended at page 10, line 23 and page 13, line 18 to update publication information for the applications recited therein.

A new paragraph has been inserted into the specification at page 10, immediately after line 23. The first four sentences of the new paragraph are identical to the first four sentences of paragraph 54, page 5 of U.S. Patent Application Publication No. 2004/0120901 A1. The last sentence of the new paragraph is identical to the sentence at column 3, lines 11-17 of U.S. Patent No. 5,130,347. U.S. Patent Application Publication No. 2004/0120901 A1, which corresponds to Serial No. 10/327,411, is expressly recited in the present specification at, for example, page 10, line 23 (as presently amended to update publication information). U.S. Patent No. 5,130,347 is expressly recited in the present specification at, for example, pages 22 and 23 in the Abbreviations/Definitions Table. U.S. Patent Application Publication No. 2004/0120901 A1 and U.S. Patent No. 5,130,347 are both expressly incorporated by reference in the present specification at page 38, lines 30-32, which recites that "[t]he complete disclosures of the patents, patent documents, and publications cited herein are incorporated by reference in their entirety as if each were individually incorporated." For the Examiner's convenience, a courtesy copy of U.S. Patent Application Publication No. 2004/0120901 A1 is attached as EXHIBIT A, and a courtesy copy of U.S. Patent No. 5,130,347 is attached as EXHIBIT B. *In accordance with 37 C.F.R. §1.57(e), the undersigned Applicants' Representative hereby states that the copy of EXHIBIT A and the copy of EXHIBIT B supplied consists of the same material incorporated by reference in the referencing application. In accordance with 37 C.F.R. §1.57(f), the undersigned Applicants' Representative hereby states that the material being inserted is the material previously incorporated by reference and that the amendment contains no new matter.* Entry and consideration of the amendment to the specification are respectfully requested.

**Amendment and Response**

Page 14 of 22

Serial No.: 10/626,261

Confirmation No.: 9585

Filed: 24 July 2003

For: HARDENABLE THERMALLY RESPONSIVE COMPOSITIONS

In the event that further clarification of the amendment is required, the Examiner is invited to contact Applicants' Representative at the below-listed telephone number.

Claims 1, 3, 21-23, 29, and 57-58 having been amended, and claims 24-25, 30-31, and 60-70 having been canceled herein, the pending claims are claims 1-23, 26-29, and 32-59. Of the pending claims, the Examiner has withdrawn from consideration claims 11-14, 20, 36-39, and 47 as being drawn to non-elected groups. Thus, pending claims 1-10, 15-19, 21-23, 26-29, 32-35, 40-46, and 48-59 are currently under consideration.

Non-elected claims 60-70 have been canceled herein solely as being drawn to non-elected restricted groups and/or patentably distinct species. Applicants reserve the right to prosecute claims drawn to the subject matter of claims 60-70 in divisional and/or continuation applications.

Claims 1, 21, 57, and 58 have been amended to recite the proviso that the polymerizable component does not comprise an ionic group. The recitation of the proviso that the polymerizable component does not comprise an ionic group is supported by the positive recitation of the polymerizable component comprising, as an alternative, ionic groups (e.g., the new paragraph inserted herein at page 10, immediately after line 23). *See, for example*, M.P.E.P. §2173.05(i), which states that "[i]f alternative elements are positively recited in the specification, they may be explicitly excluded in the claims."

Claim 3 has been rewritten as an independent claim and amended to recite that the polymerizable component is a glass ionomer cement. Claim 22 has been amended similarly to recite that the polymerizable component is a glass ionomer cement.

Claims 23 and 29 have been amended to recite applying a thermally responsive composition in a low viscosity state at a pre-treatment temperature to hard tissue of an oral surface. The amendment is supported by the specification at, for example, page 18, lines 13-17.

Reconsideration and withdrawal of the rejections are respectfully requested.

## Amendment and Response

Page 15 of 22

Serial No.: 10/626,261

Confirmation No.: 9585

Filed: 24 July 2003

For: HARDENABLE THERMALLY RESPONSIVE COMPOSITIONSRejections under 35 U.S.C. §102

The Examiner rejected claims 1-7, 15-19, 21-30, 34-35, 40, 44-46, 48-49, and 53-57 under 35 U.S.C. §102(b) as being anticipated by Joshi et al. (U.S. Patent No. 5,252,318). Claims 24-25 and 30 having been canceled, the rejection as applied to pending claims 1-7, 15-19, 21-23, 26-29, 34-35, 40, 44-46, 48-49, and 53-57 (as amended) is respectfully traversed.

Independent claims 1, 3, 21-23, 29, and 57 (as amended) each recite, among other things, a thermally responsive composition including *a polymerizable component*. Applicants respectfully submit that Joshi et al. fails to disclose a thermally responsive composition including *a polymerizable component*.

Nonetheless, the Examiner asserted that "[c]rosslinking agents may be added to the compositions to create three dimensional polymer networks" (page 4, lines 1-2, of the Office Action mailed 19 April 2006). Applicants respectfully note that the Examiner has not indicated any specific disclosure in Joshi et al. that supports the above-cited assertion. Thus, in the event that the present rejection is maintained, further clarification of the support for the rejection is respectfully requested in the next Official Communication. However, for purposes of responding to the present rejection, Applicants are assuming for sake of argument that the Examiner is referring to the following passage in Joshi et al.:

Exemplary pH-triggered gelling polymers that produce thickening at increased pH are preferably acidic polymers such as those containing carboxyl groups. Those skilled in the art will appreciate that small amounts of crosslinking agents such as divinyl benzene, divinyl glycol and polyalkenyl polyethers will facilitate the formation of three dimensional polymer network structures in the resultant cross-linked polyacrylates. (Column 3, lines 51-56).

Applicants respectfully disagree with the Examiner's assertion. Applicants respectfully submit that it would be clear to one of skill in the art that the crosslinking agent is added to the

**Amendment and Response**

Serial No.: 10/626,261

Confirmation No.: 9585

Filed: 24 July 2003

For: HARDENABLE THERMALLY RESPONSIVE COMPOSITIONS

monomers used to make the exemplary pH-triggered gelling polymers, not to a thermally responsive composition.

For at least this reason, Applicants respectfully submit that claims 1-7, 15-19, 21-23, 26-29, 34-35, 40, 44-46, 48-49, and 53-57 are not anticipated by Joshi et al.

The Examiner rejected claims 1-9, 15-19, 21-35, 40-46, 48-51, and 53-59 under 35 U.S.C. §102(b) as being anticipated by Bromberg et al. (U.S. Patent No. 5,939,485). Claims 24-25 and 30-31 having been canceled, the rejection as applied to pending claims 1-9, 15-19, 21-23, 26-29, 32-35, 40-46, 48-51, and 53-59 (as amended) is respectfully traversed.

Independent claims 1, 21, 57, and 58 (as amended) each recite, among other things, the proviso that the polymerizable component does not comprise an ionic group. The Examiner pointed to the disclosure in Bromberg et al. of structural polymers made from monomers, presumably as a disclosure of a polymerizable component different than the modifier as recited in the present claims. However, Bromberg et al. recite that "[s]tructural components include an *ionizable polymer*" (column 7, line 54). *See, also*, column 11, lines 30-33, noting the "ionic nature" of the structural component. In contrast, independent claims 1, 21, 57, and 58 (as amended) recite that the polymerizable component does not comprise an ionic group. For at least this reason, Applicants respectfully submit that independent claims 1, 21, 57, and 58, along with dependent claims 2, 4-9, 15-19, and 59 are not anticipated by Bromberg et al.

Independent claims 3 and 22 (as amended) each recite a thermally responsive composition including, among other things, a thermally responsive viscosity modifier and a polymerizable component different than the modifier, wherein the polymerizable component is a glass ionomer cement. Because Bromberg et al. fails to disclose a thermally responsive composition including a thermally responsive viscosity modifier and a polymerizable component different than the modifier, wherein the polymerizable component is a glass ionomer cement, Applicants respectfully submit that claims 3 and 22 are not anticipated by Bromberg et al.

**Amendment and Response**

Page 17 of 22

Serial No.: 10/626,261

Confirmation No.: 9585

Filed: 24 July 2003

For: HARDENABLE THERMALLY RESPONSIVE COMPOSITIONS

Independent claims 23 and 29 (as amended) each recite, among other things, applying a thermally responsive composition to hard tissue of an oral surface. Because Bromberg et al. fails to disclose applying a thermally responsive composition to hard tissue of an oral surface, Applicants respectfully submit that independent claims 23 and 29, along with dependent claims 26-28, 32-35, 40-46, 48-51, and 53-56, are not anticipated by Bromberg et al.

The Examiner rejected claims 1-10, 15-17, 21, 23-25, 29-35, 40-44, 50-51, 55-56, and 58-59 under 35 U.S.C. §102(b) as being anticipated by Mitra et al. (U.S. Patent No. 5,922,786). Claims 24-25 and 30-31 having been canceled, the rejection as applied to pending claims 1-10, 15-17, 21, 23, 29, 32-35, 40-44, 50-51, 55-56, and 58-59 (as amended) is respectfully traversed.

Independent claims 1, 3, 21, 23, 29, and 58 (as amended) each recite, among other things, a thermally responsive composition that includes *a thermally responsive viscosity modifier*. Applicants respectfully submit that Mitra et al. fails to disclose a thermally responsive composition including *a thermally responsive viscosity modifier*.

Nonetheless, the Examiner asserted that "[t]he hydrophilic component of the system includes polymers and copolymers of polyalkylene oxides, which are thermally responsive viscosity modifiers" (page 6, lines 9-11, of the Office Action mailed 19 April 2006). Applicants respectfully disagree with the Examiner's assertion.

Mitra et al. recite the following:

More specific examples of preferred hydrophilic components are non-ionic polymers or copolymers, e.g. polyalkylene oxides (polyoxymethylene, polyethyleneoxide, polypropylene oxide) polyethers (polyvinylmethyl ether), polyethyleneimine copolymers, polyacrylamides and polymethacrylamides, polyvinylalcohol, saponified polyvinylacetate, polyvinylpyrrolidone, polyvinylloxazolidone, polymers containing N-oxysuccinimido groups, ionic or ionizable polymers and copolymers containing polyacrylic acid, polymethacrylic acid in unionized, partially neutralized or fully neutralized form, polyethyleneimine and its salts, polyethylene

## Amendment and Response

Serial No.: 10/626,261

Confirmation No.: 9585

Filed: 24 July 2003

For: HARDENABLE THERMALLY RESPONSIVE COMPOSITIONS

Page 18 of 22

sulfonic acid and polyaryl sulfonic acids in unionized, partially neutralized or fully neutralized form, polyphosphoric and phosphonic acids in unionized, partially neutralized or fully neutralized form. (Column 7, line 58 to column 8, line 6).

First, there is no explicit disclosure in Mitra et al. that teaches that polymers and copolymers of polyalkylene oxides are thermally responsive viscosity modifiers. Further, to the extent that the Examiner is implying that polymers and copolymers of polyalkylene oxides are *inherently* thermally responsive viscosity modifiers, Applicants again disagree. Applicants note that the Examiner has failed to show that polymers and copolymers of polyalkylene oxides are *necessarily* thermally responsive viscosity modifiers. For example, while certain block copolymers of certain alkylene oxides can be thermally responsive viscosity modifiers, there is no disclosure or suggestion in Mitra et al. that the copolymers disclosed therein are necessarily even block copolymers.

For at least this reason, Applicants respectfully submit that Mitra et al. does not anticipate claims 1-10, 15-17, 21, 23, 29, 32-35, 40-44, 50-51, 55-56, and 58-59 (as amended).

The Examiner rejected claims 1-10, 15-19, 29-35, 40-46, 48-52, and 55-59 under 35 U.S.C. §102(e) as being anticipated by Bublewitz et al. (U.S. Patent No. 2002/0197214). Claims 30-31 having been canceled, the rejection as applied to pending claims 1-10, 15-19, 29, 32-35, 40-46, 48-52, and 55-59 (as amended) is respectfully traversed.

Independent claims 1, 3, 29, and 57-58 (as amended) each recite, among other things, a thermally responsive composition that includes *a thermally responsive viscosity modifier and a polymerizable component different than the modifier*. Applicants respectfully submit that Bublewitz et al. fails to disclose a thermally responsive composition including *a thermally responsive viscosity modifier and a polymerizable component different than the modifier*.

Nonetheless, the Examiner asserted that "[t]he second component may comprise a polyalkylene glycol including copolymers of polyethylene glycol and polypropylene glycol,

**Amendment and Response**

Page 19 of 22

Serial No.: 10/626,261

Confirmation No.: 9585

Filed: 24 July 2003

For: HARDENABLE THERMALLY RESPONSIVE COMPOSITIONS

which are thermal responsive polymers" (page 7, lines 2-4, of the Office Action mailed 19 April 2006). Applicants respectfully note that the Examiner has not indicated any specific disclosure in Bublewitz et al. that supports the above-cited assertion. Thus, in the event that the present rejection is maintained, further clarification of the support for the rejection is respectfully requested in the next Official Communication. However, for purposes of responding to the present rejection, Applicants are assuming for sake of argument that the Examiner is referring to the passage in paragraph 0060 of Bublewitz et al. that recites "(meth)acrylates and di(meth)acrylates of block copolymers of ethylene oxide and propylene oxide." Applicants respectfully disagree with the Examiner's assertion.

First, Applicants respectfully submit that there is no disclosure or suggestion in Bublewitz et al. that the recited "(meth)acrylates and di(meth)acrylates of block copolymers of ethylene oxide and propylene oxide" are thermally responsive viscosity modifiers. In contrast, Bublewitz et al. relates to "a dental bleaching material which contains at least one bleaching substance and at least one support material capable of solidifying by a *chemical reaction*" (paragraph 0001, emphasis added).

Further, even if the "(meth)acrylates and di(meth)acrylates of block copolymers of ethylene oxide and propylene oxide" recited in paragraph 0060 of Bublewitz et al. arguably were thermally responsive viscosity modifiers, Applicants respectfully submit that the "(meth)acrylates and di(meth)acrylates of block copolymers of ethylene oxide and propylene oxide" recited in paragraph 0060 of Bublewitz et al. are merely preferred embodiments of the alleged disclosure of "the supporting component comprising methacrylate monomers . . . (paragraphs 0059-0061)" noted by the Examiner (page 6, last paragraph, of the Office Action mailed 19 April 2006). As such, Applicants were unable to locate any disclosure of the combination of a *thermally responsive viscosity modifier* and a *polymerizable component different than the modifier* in Bublewitz et al. as alleged by the Examiner. In the event that this rejection is maintained, appropriate clarification is respectfully requested in the next Official Communication.

**Amendment and Response**

Serial No.: 10/626,261

Confirmation No.: 9585

Filed: 24 July 2003

For: HARDENABLE THERMALLY RESPONSIVE COMPOSITIONS

Page 20 of 22

For at least these reasons, Applicants respectfully submit that Bublewitz et al. does not anticipate claims 1-10, 15-19, 29, 32-35, 40-46, 48-52, and 55-59 (as amended).

Reconsideration and withdrawal of the rejections under 35 U.S.C. §102 are respectfully requested.

**Rejection under 35 U.S.C. §103**

The Examiner rejected claim 52 under 35 U.S.C. §103(a) as being unpatentable over Mitra et al. (U.S. Patent No. 5,922,786) in view of Murray (U.S. Patent No. 4,659,572). This rejection is respectfully traversed.

Claim 52 ultimately depends from claim 29. As discussed herein above in the remarks in response to the rejection of claim 29 as being anticipated by Mitra et al., Mitra et al. lacks, among other things, a disclosure or suggestion of a thermally responsive composition that includes a thermally responsive viscosity modifier. Applicants respectfully submit that Murray fails to disclose or suggest that which is missing from Mitra et al.

For at least this reason, Applicants respectfully submit that the Examiner has failed to establish a *prima facie* of obviousness for claim 52 being unpatentable over Mitra et al. in view of Murray. Reconsideration and withdrawal of the rejection of claim 52 under 35 U.S.C. §103 are respectfully requested.



**Amendment and Response**

Page 21 of 22

Serial No.: 10/626,261

Confirmation No.: 9585

Filed: 24 July 2003

For: HARDENABLE THERMALLY RESPONSIVE COMPOSITIONS**Request for Rejoinder**

Currently pending claims 11-14, 20, 36-39, and 47 have been withdrawn from consideration by the Examiner as being drawn to non-elected species. Claims 11-14 and 20 ultimately depend from independent claim 1; and claims 36-39 and 47 ultimately depend from independent claim 29. Upon an indication of claims 1 and/or 29 being allowable, Applicants respectfully request that the restriction/election requirement be reconsidered, and that claims 11-14, 20, 36-39, and 47 be rejoined, examined, and passed on to allowance pursuant to M.P.E.P. §821.04. *See, for example, In re Ochiai*, 71 F.3d 1565, 37 USPQ2d 1127 (Fed. Cir. 1995) and *In re Brouwer*, 77 F.3d 422, 37 USPQ2d 1663 (Fed. Cir. 1996).

**Amendment and Response**

Page 22 of 22

Serial No.: 10/626,261

Confirmation No.: 9585

Filed: 24 July 2003

For: HARDENABLE THERMALLY RESPONSIVE COMPOSITIONS**Summary**

It is respectfully submitted that all the pending claims in condition for allowance and notification to that effect is respectfully requested. The Examiner is invited to contact Applicants' Representatives, at the below-listed telephone number, if it is believed that prosecution of this application may be assisted thereby.

Respectfully submitted

By

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**CERTIFICATE UNDER 37 CFR §1.8:**

The undersigned hereby certifies that the Transmittal Letter and the paper(s), as described hereinabove, are being transmitted by facsimile in accordance with 37 CFR §1.6(d) to the Patent and Trademark Office, addressed to Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on this 21<sup>st</sup> day of August, 2006, at 3:56 p.m. (Central Time).

By: Name: Rachel G. Gribble